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10/614,992	07/07/2003	Joseph Yudovsky	AMAT/4191.C1/CPI/WCVD/PJS	8160

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EXAMINER

MACARTHUR, SYLVIA

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/614,992  
Filing Date: July 07, 2003  
Appellant(s): YUDOVSKY ET AL.

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Keith M. Tackett  
For Appellant

**MAILED**

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**GROUP 1700**

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 9/7/2006 appealing from the Office action  
mailed March 24, 2006

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**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

Claims 3-6,8-14, and 17-25 stand finally rejected.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

Patent Number	Inventor Name	Publication Date
US 6,159,299	Koai et al	12-2000
EP 0553691	Cheng et al	04-1993

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

a) Claims 3-6, 8-14 and 17-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheng et al (EP 0553691).

*Regarding claim 3:* Cheng teaches an apparatus comprising:

a substrate support 40, a first edge ring 50 disposed on the substrate support, the first edge ring having one or more tapered recesses 52 and a second edge ring 100 having one or more matching tapered pins 72 for mating engagement with the one or more tapered recesses of the first edge ring, wherein the first edge ring comprises a purge ring, see col. 10 lines 32-47 and Fig. 7

*Regarding claim 4:* An apparatus comprising:

a substrate support 40, a first edge ring disposed on the substrate support, the first edge ring having one or more tapered recesses 52, and a second edge ring having one or more matching tapered pins for mating engagement with the one or more tapered recesses of the first edge ring, wherein the second edge ring comprises a shadow ring (the shield acts as a shadow ring in that it masks a portion of the wafer as discussed in the specification page 3 of the present invention).

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*Regarding claim 5:* An apparatus comprising: a substrate support; a first edge ring disposed on the substrate support, the first edge ring 50 having one or more tapered recesses and a second edge ring 70 having one or more matching tapered pins 72 for mating engagement with the one or more tapered recesses of the first edge ring, wherein the first edge ring includes one tapered recess and one diametrically positioned tapered slot, see claim 11 of Cheng, and wherein the second edge ring includes two tapered pins diametrically positioned for mating engagement with the recess and the slot.

*Regarding claim 6:* The apparatus of claim 3, wherein the substrate support comprises a purge gas channel, see col. 8 lines 25-58 and Fig. 5.

*Regarding claim 8:* An apparatus for processing substrates, comprising: a chamber, an apparatus for processing a substrate support disposed in the chamber, a first edge ring 50 disposed on the substrate support, the first edge ring having one or more tapered recesses and a second edge ring having one or more matching tapered pins 72 for mating engagement with the one or more tapered recesses of the first edge ring, further comprising: a chamber body ring 70 disposed on an interior surface of the chamber, the chamber body ring having one or more recesses for supporting engagement with the second edge ring, see Figs. 5-8 of Cheng et al.

*Regarding claim 9:* The apparatus of claim 8 wherein the first edge ring includes one or more slots disposed for mating engagement with the one or more tapered pins on the second edge ring, see Claim 11 of Cheng et al.

*Regarding claims 10 and 21-25:* The apparatus of claim 8 wherein the first edge ring 50 comprises a purge ring see col. 10 lines 32-43 and Fig. 5.

*Regarding claim 11:* The apparatus of claim 8 wherein the second edge ring 70 comprises a shadow ring (the shield acts as a shadow ring in that it masks a portion of the wafer as discussed in the specification page 3 of the present invention).

*Regarding claim 12:* The apparatus of claim 8 wherein the first edge ring includes one tapered recess and one diametrically positioned tapered slot, and wherein the second edge ring includes two tapered with the recess and the slot, see Figs. 5-8 of Cheng et al. pins diametrically positioned for mating engagement

*Regarding claim 13:* The apparatus of claim 8 wherein the substrate support comprises a purge gas channel, and the first edge ring comprises a purge ring col. 10 lines 32-43 and Fig 5.

*Regarding claim 14:* The apparatus of claim 8 wherein the one or more recesses on the chamber body ring include tapered side surfaces.

*Regarding claim 17:* A method for supporting a substrate in a chamber comprising: positioning the substrate on a substrate support having a first edge ring 50 disposed around a substrate supporting surface, the first edge ring having one or more recesses 52, and positioning a second edge ring above the first edge ring, wherein the second edge ring 70 has one or more pins 72 for mating engagement with the one or more recesses on the first edge ring, and wherein the first edge ring comprises a purge ring see Figs. 5-8 of Cheng et al and col. 10 lines 32-43.

*Regarding claim 18:* A method for supporting a substrate in a chamber comprising: positioning the substrate on a substrate support having a first edge ring disposed around a substrate supporting surface, the first edge ring having one or more recesses, and positioning a second edge ring above the first edge ring, wherein the second edge ring has one or more pins for

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mating engagement with the one or more recesses on the first edge ring wherein the second edge ring comprises a shadow ring the shield acts as a shadow ring in that it masks a portion of the wafer (as discussed in the specification page 3 of the present invention).

*Regarding claim 19:* A method for supporting a substrate in a chamber, comprising: positioning the substrate on a substrate support having a first edge ring disposed around a substrate supporting surface, the first edge ring having one or more recesses, and positioning a second edge ring above the first edge ring, wherein the second edge ring has one or more pins for mating engagement with the one or more recesses on the first edge ring wherein the first edge ring includes one tapered recess and one diametrically positioned tapered slot, and wherein the second edge ring includes two tapered pins diametrically positioned for mating engagement with the recess and the slot see claim 11 of Cheng et al.

*Regarding claim 20:* A method for supporting a substrate in a chamber, comprising: positioning the substrate on a substrate support having a first edge ring disposed around a substrate supporting surface the first edge ring having one or more recesses, positioning a second edge ring above the first edge ring, wherein the second edge ring has one or more pins for mating engagement with the one or more recesses on the first edge ring and flowing a purge gas around the substrate during substrate processing see Figs. 5-8 and col. 10 lines 32-43.

b) Claims 3-6, 8-14 and 17-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Koai et al (US 6,159,299).

*Regarding claim 3:* Koai et al teaches an apparatus comprising: a substrate support pedestal 150, a first edge ring 200 disposed on the substrate support 150, the first edge ring (comprises a top 240, middle 230 and 220 bottom ring) having one or more tapered recesses and a second edge ring 280 (with outer portion 284) having one or more matching tapered pins 271 for mating engagement with the one or more tapered recesses of the first edge ring, wherein the first edge ring comprises a purge ring, see Fig. 2c. Channels 156 are formed in the pedestal to provide gas flow.

*Regarding claim 4:* An apparatus comprising: a substrate support 150, a first edge ring disposed on the substrate support, the first edge ring 200 having one or more tapered recesses (see Fig. 2c), and a second edge ring (outer portion 284 comprises the pins) having one or more matching tapered pins for mating engagement with the one or more tapered recesses of the first edge ring, wherein the second edge ring comprises a shadow ring (the ring acts as a shadow ring in that it masks a portion of the wafer as discussed in the specification page 3 of the present invention).

*Regarding claim 5:* An apparatus comprising: a substrate support; a first edge ring disposed on the substrate support, the first edge ring 200 having one or more tapered recesses and a second edge ring 280 having one or more matching tapered pins 271 for mating engagement with the one or more tapered recesses of the first edge ring, wherein the first edge ring includes one tapered recess and one diametrically positioned tapered slot, see Fig. 2c, and wherein the second edge ring includes two tapered pins diametrically positioned for mating engagement with the recess and the slot.



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Regarding claim 6: The apparatus of claim 3, wherein the substrate support comprises a purge gas channel, see col. 5 lines 50-67 and Fig. 2c.

*Regarding claim 8:* An apparatus for processing substrates, comprising:  
a chamber 100, an apparatus for processing a substrate support disposed in the chamber, a first edge ring 200 disposed on the substrate support, the first edge ring having one or more tapered recesses and a second edge ring having one or more matching tapered pins 271 for mating engagement with the one or more tapered recesses of the first edge ring, further comprising: a chamber body ring 200 disposed on an interior surface of the chamber, the chamber body ring having one or more recesses for supporting engagement with the second edge ring, see 2c of Koai et al.

*Regarding claim 9:* The apparatus of claim 8 wherein the first edge ring includes one or more slots disposed for mating engagement with the one or more tapered pins on the second edge ring, see 2c of Koai et al.

*Regarding claims 10 and 21-25:* The apparatus of claim 8 wherein the first edge ring 200 comprises a purge ring see col. 5 lines 50-67 and Fig. 2c.

*Regarding claim 11:* The apparatus of claim 8 wherein the second edge ring 280 comprises a shadow ring (the shield acts as a shadow ring in that it masks a portion of the wafer as discussed in the specification page 3 of the present invention).

*Regarding claim 12:* The apparatus of claim 8 wherein the first edge ring includes one tapered recess and one diametrically positioned tapered slot, and wherein the second edge ring includes two tapered with the recess and the slot, see 2c of Koai et al.  
pins diametrically positioned for mating engagement

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*Regarding claim 13:* The apparatus of claim 8 wherein the substrate support comprises a purge gas channel, and the first edge ring comprises a purge ring see col. 5 lines 50-67 and Fig. 2c.

*Regarding claim 14:* The apparatus of claim 8 wherein the one or more recesses on the chamber body ring include tapered side surfaces, see Fig. 2c

*Regarding claim 17:* A method for supporting a substrate in a chamber comprising: positioning the substrate on a substrate support having a first edge ring 200 disposed around a substrate supporting surface, the first edge ring having one or more recesses (see Fig. 2c), and positioning a second edge ring above the first edge ring, wherein the second edge ring 280 (especially outer portion 2840 has one or more pins 271 for mating engagement with the one or more recesses on the first edge ring, and wherein the first edge ring comprises a purge ring see Fig. 2c.

*Regarding claim 18:* A method for supporting a substrate in a chamber comprising: positioning the substrate on a substrate support having a first edge ring disposed around a substrate supporting surface, the first edge ring having one or more recesses, and positioning a second edge ring above the first edge ring, wherein the second edge ring has one or more pins for mating engagement with the one or more recesses on the first edge ring wherein the second edge ring comprises a shadow ring, the shield acts as a shadow ring in that it masks a portion of the wafer (as discussed in the specification page 3 of the present invention), see Fig. 2c.

*Regarding claim 19:* A method for supporting a substrate in a chamber. comprising: positioning the substrate on a substrate support having a first edge ring disposed around a substrate supporting surface. the first edge ring having one or more recesses, and

positioning a second edge ring above the first edge ring, wherein the second edge ring has one or more pins for mating engagement with the one or more recesses on the first edge ring wherein the first edge ring includes one tapered recess and one diametrically positioned tapered slot, and wherein the second edge ring includes two tapered pins diametrically positioned for mating engagement with the recess and the slot see claim 2c of Koai et al (note Fig. 2c illustrates one side of the rings the second side as a duplicate structure, thus there are two pins one on the left and one on the right).

*Regarding claim 20:* A method for supporting a substrate in a chamber, comprising: positioning the substrate on a substrate support having a first edge ring disposed around a substrate supporting surface the first edge ring having one or more recesses, positioning a second edge ring above the first edge ring, wherein the second edge ring has one or more pins for mating engagement with the one or more recesses on the first edge ring and flowing a purge gas around the substrate during substrate processing see col. 5 lines 50-68 of Koai et al.

#### **(10) Response to Argument**

*a) Cheng does not teach two edge rings.*

Cheng teaches edge ring (shield ring 50) and edge ring (support means 70). Both of these are ring shaped and are in a mating relationship with one another due to the recesses of edge ring 50 and the pins of edge ring 70.

*b) Support means 70 of Cheng et al does not anticipate an edge ring.*

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The support means 70 of Cheng et al is annular shaped per review of Figs. 6 and 7 show that pin 72 is disposed on support means 70 , Figs. 4 and 4a show the pin 72 (attached to 70 ) in mating relationship with edge ring 50. The claims do not exclude edge rings which are in mating relationship in the horizontal direction or in a direction parallel to the support surface 40.

*c) Koai et al does not teach a second edge ring is mating engagement with a first edge ring.*

Koai teaches a second edge ring 280 which comprises an outer portion 284 comprising the pins 271. Col. 6 lines 18-25 states that the edge ring 200 rests upon pins 272 which are screwed into the outer portion 284 of purge 280 and the edge ring 200 is screwed to purge ring 280 via bolts (pins 271) anticipating a mating engagement of the first and second edger rings.

d) The slots of purge ring 280 are not tapered. The shape of the pins/bolts 271 of Koai et al are tapered, see Figs. 2b and 2c. In order for the ring 200 to mate with the bolts 271 the recesses must be of a complementary, in this case tapered as well.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Sylvia R. MacArthur Examiner of Record



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